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(71) Applicant

David Robert Lamonby,  
29 The Crescent, Purbrook, Havant, Hampshire

(72) Inventor

David Robert Lamonby

(74) Agent and/or Address for Service

Graham Jones and Company,  
77 Beaconsfield Road, Blackheath, London SE3 7LG

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(56) Documents cited

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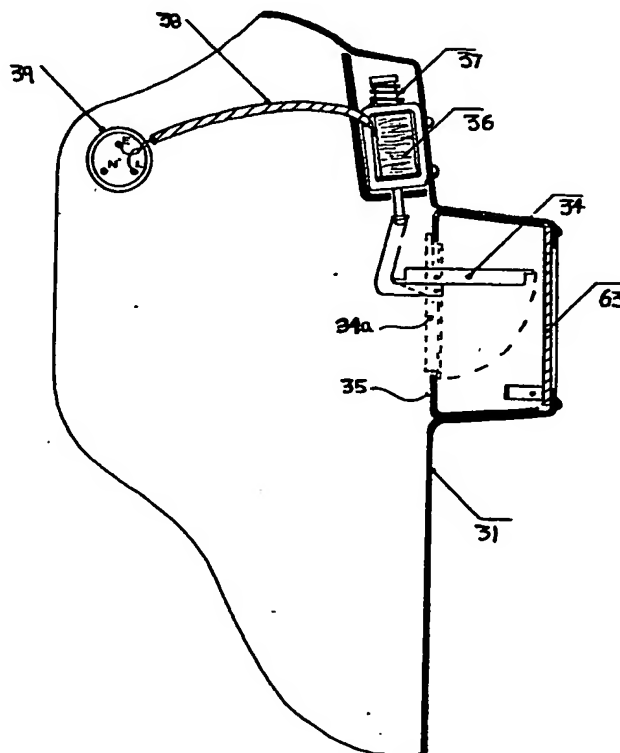
(58) Field of search

G2J

## (54) Improvements in or relating to welding

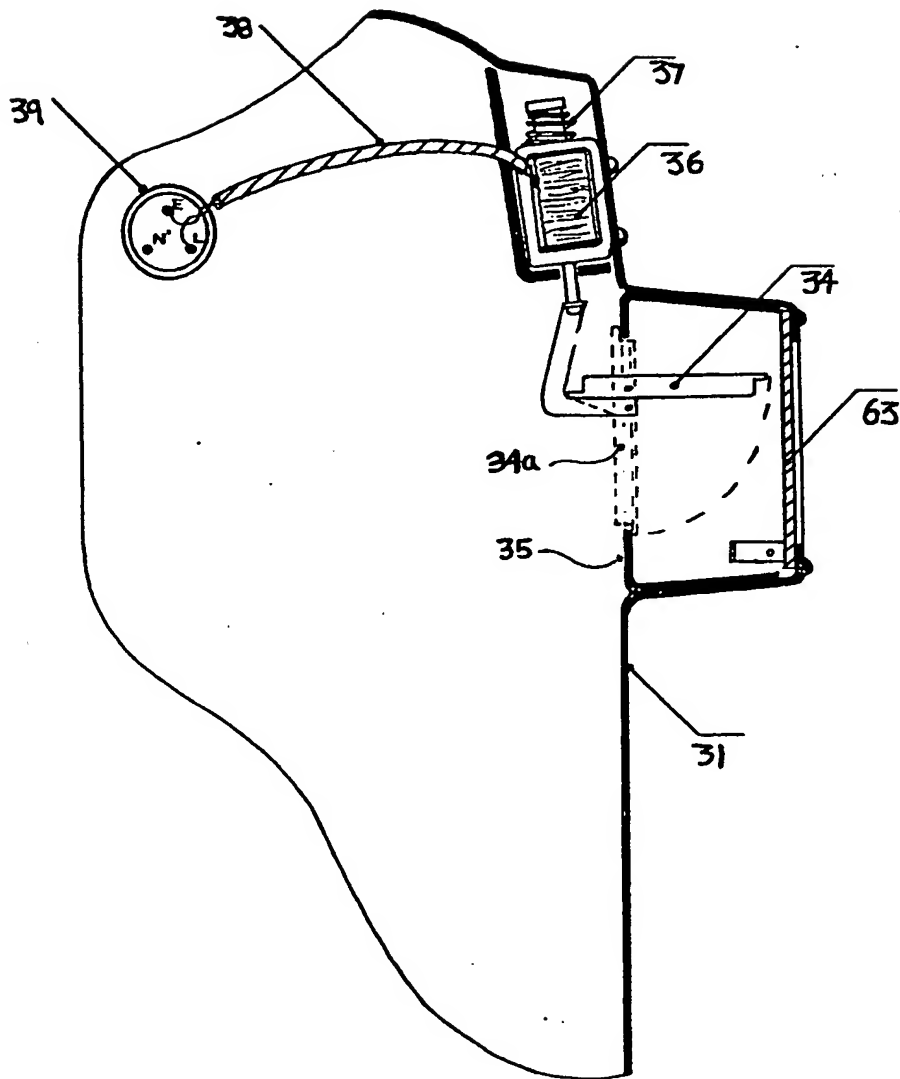
(57) A welding mask has a filter 34, for protecting the eyes, pivoted behind a spatter glass 63. The filter is moved by a solenoid 36 connected to a plug 39 mounted on the mask. The plug is connected to an electrical supply which also supplies current for arc welding or inert gas shrouded welding. The switching of the supplies is such that the filter is always in position protecting the eyes before the arc begins and after the arc ceases.

FIG. 1.



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FIG. 1.



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FIG. 2.

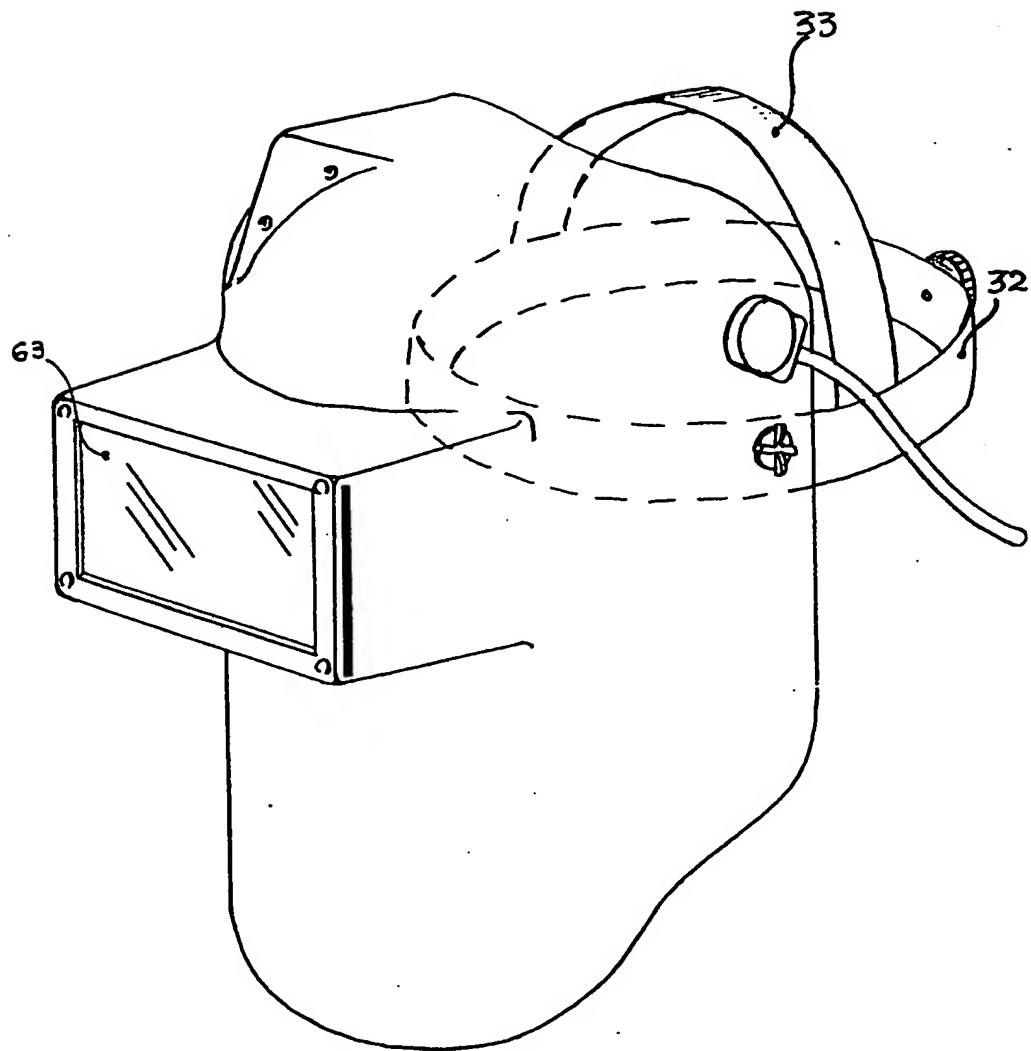
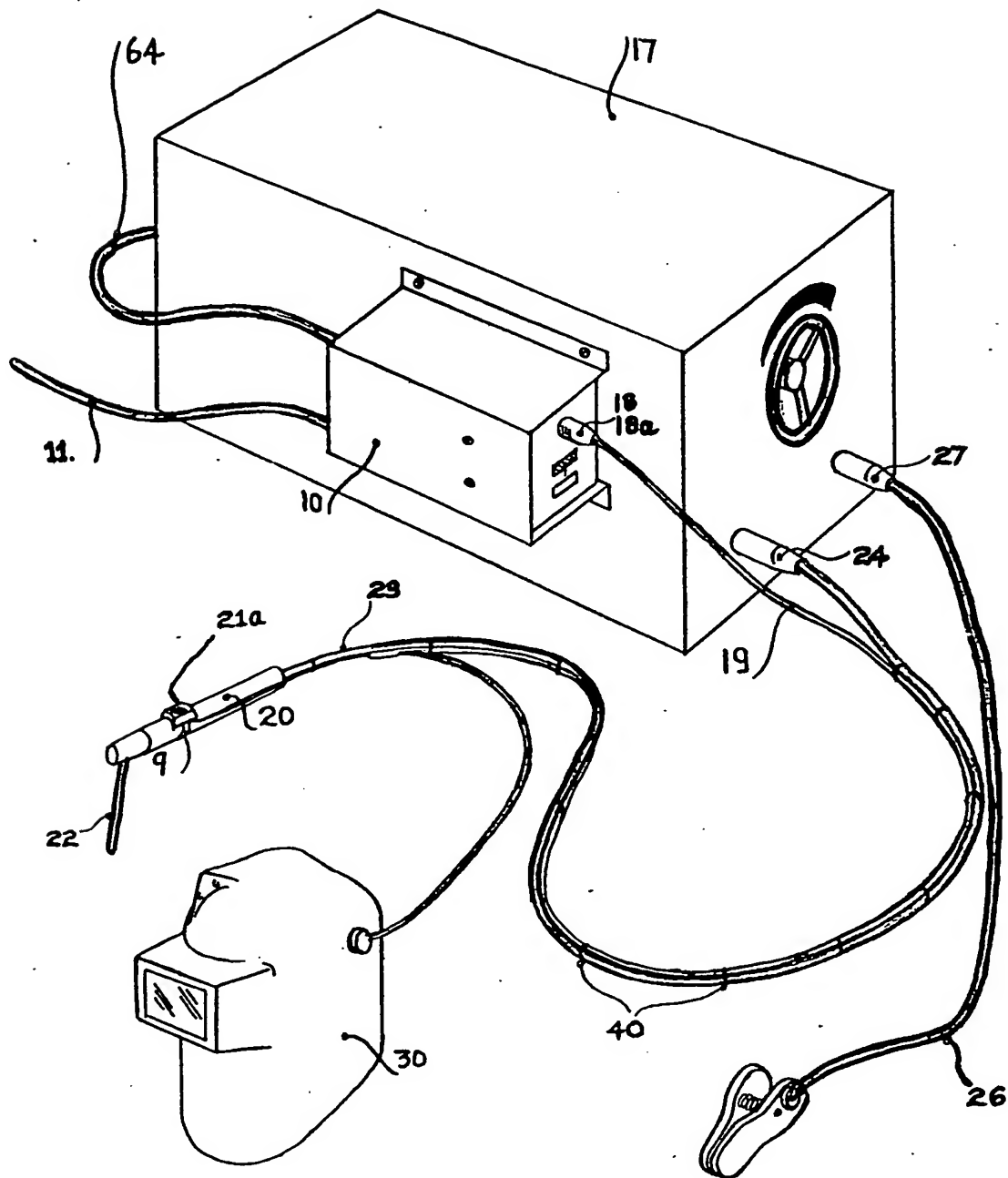


FIG. 3.



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FIG. 4.

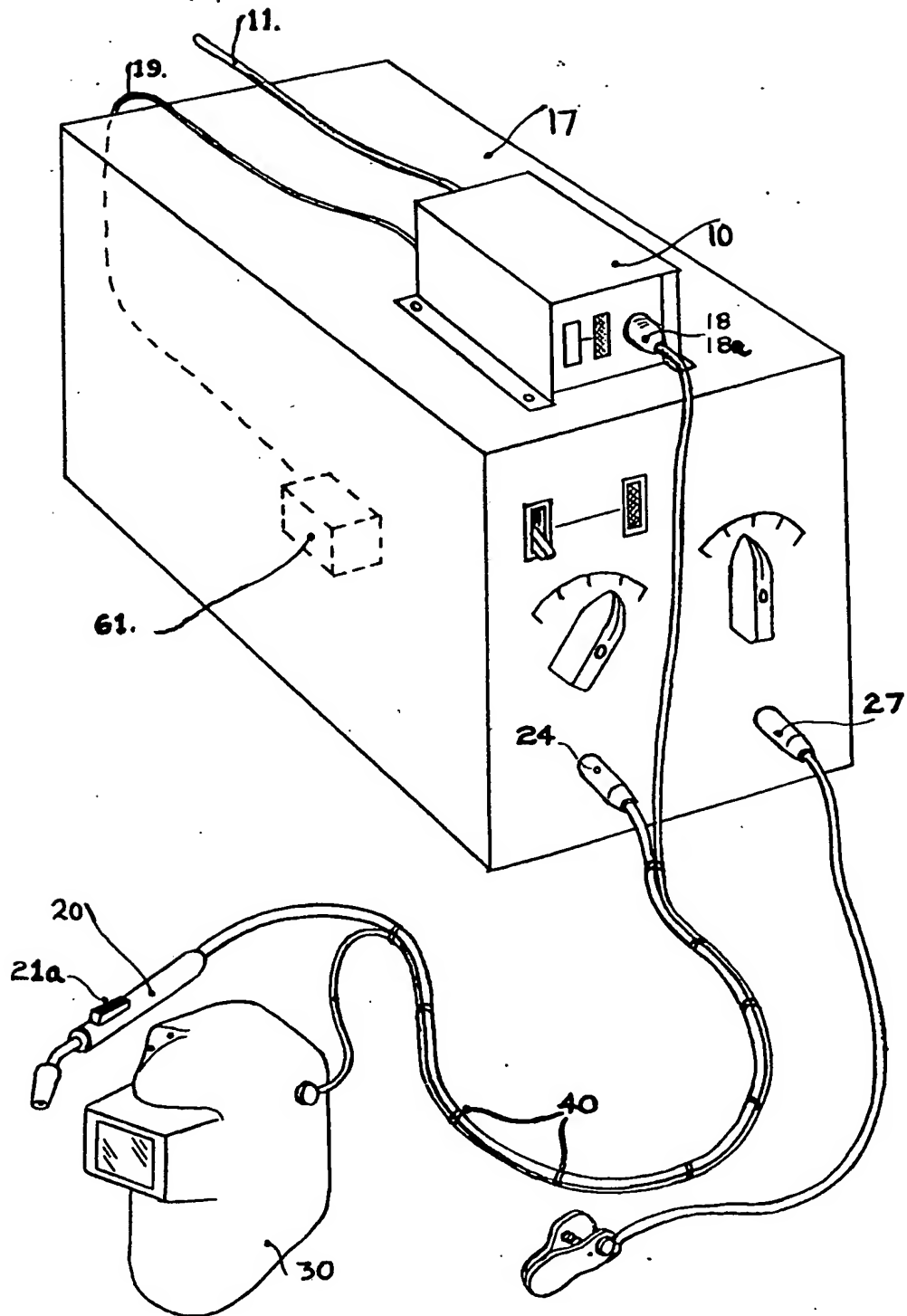


FIG. 5.

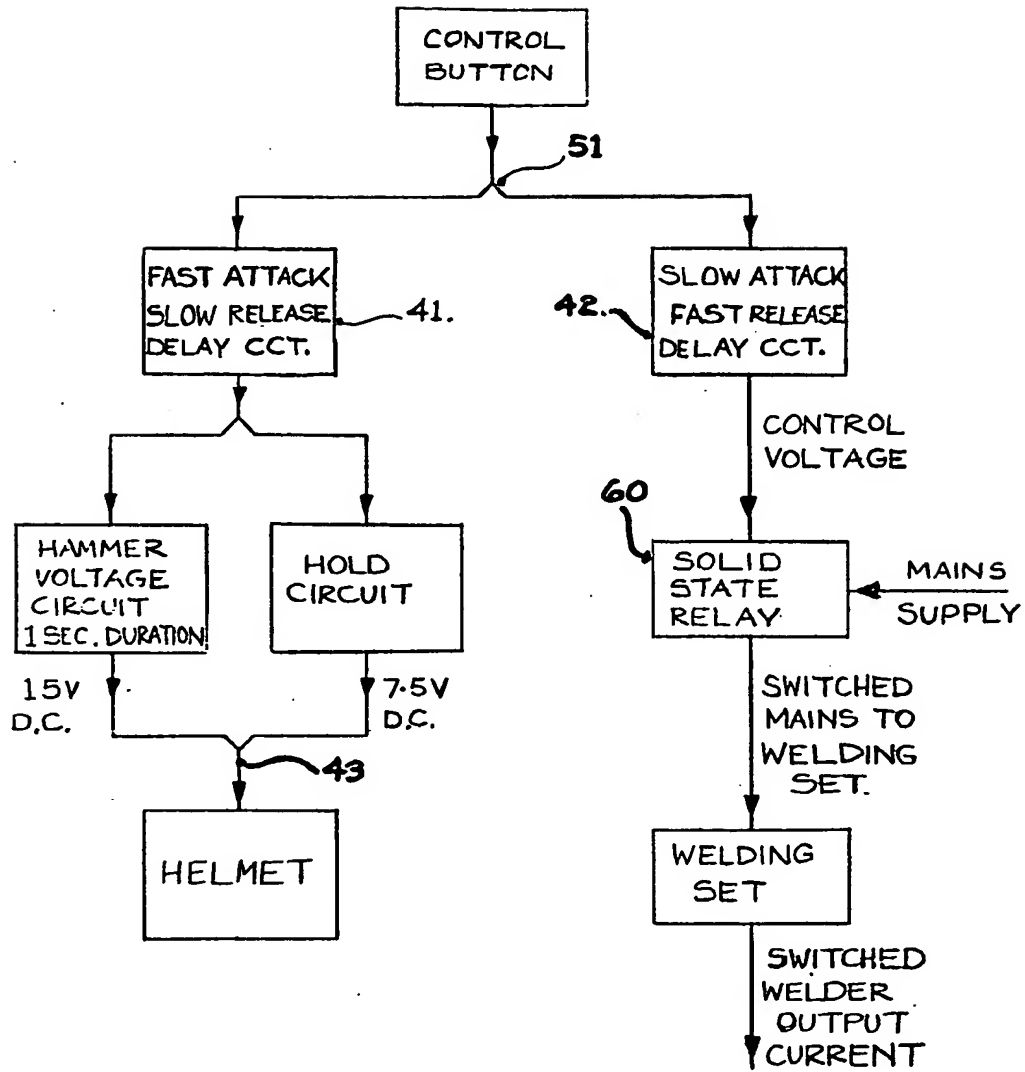
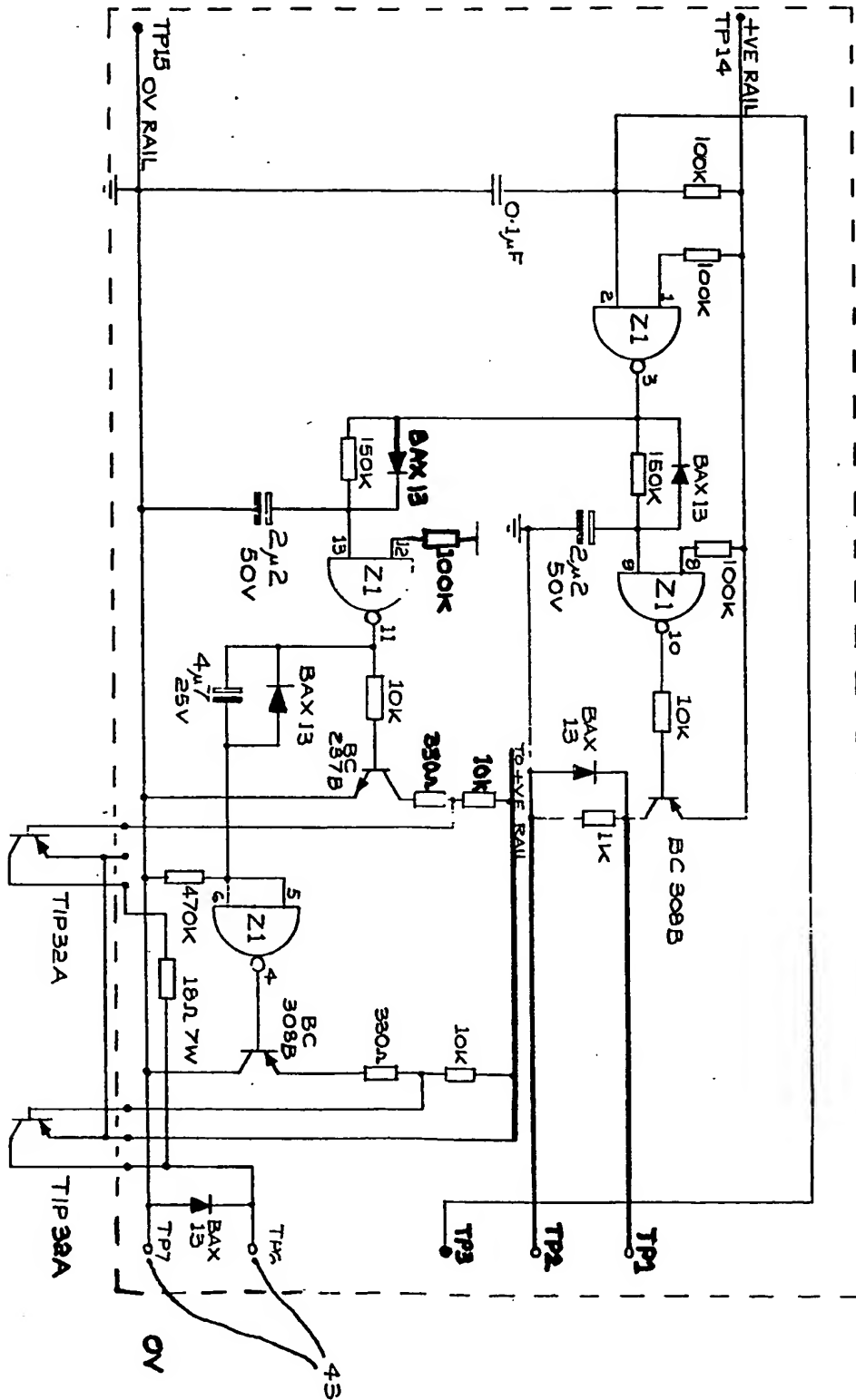
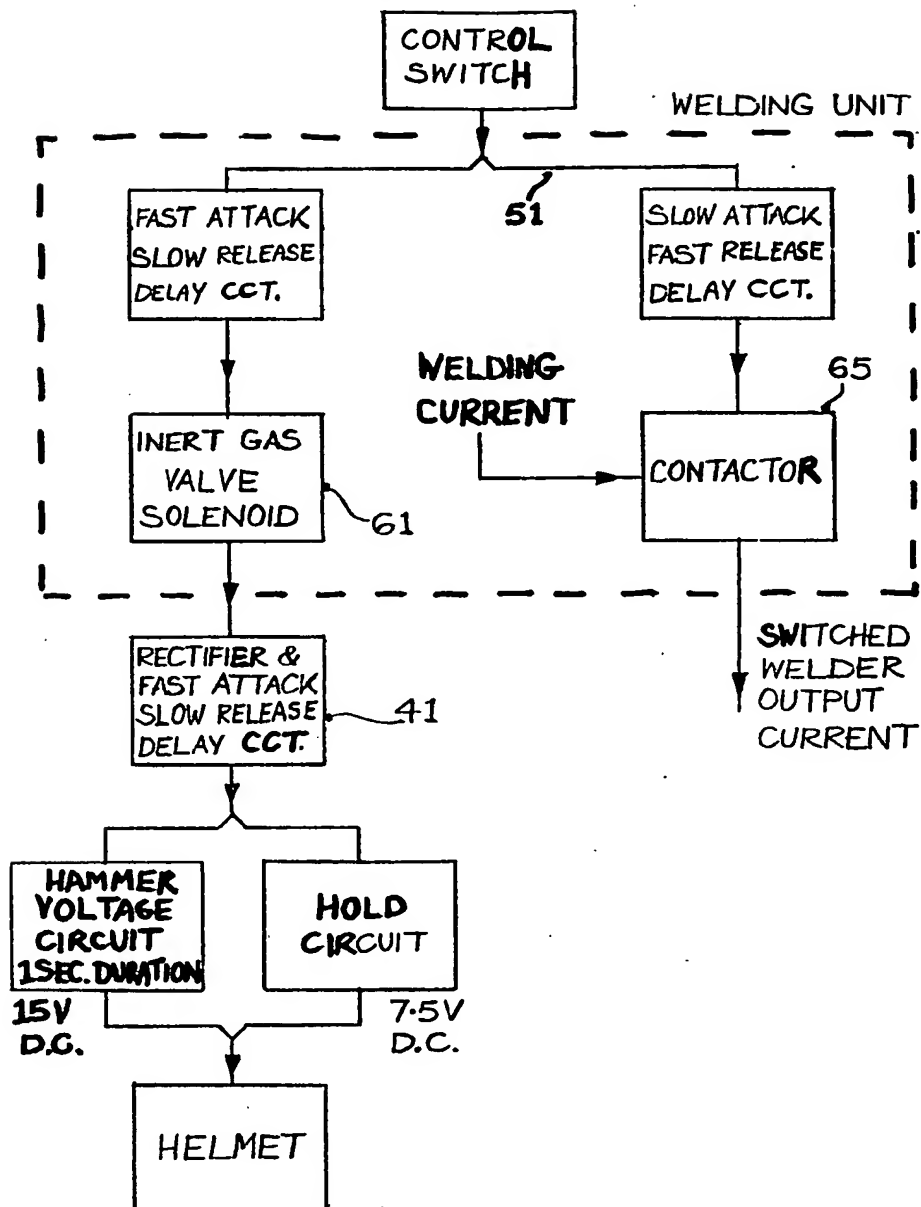


FIG. 6.



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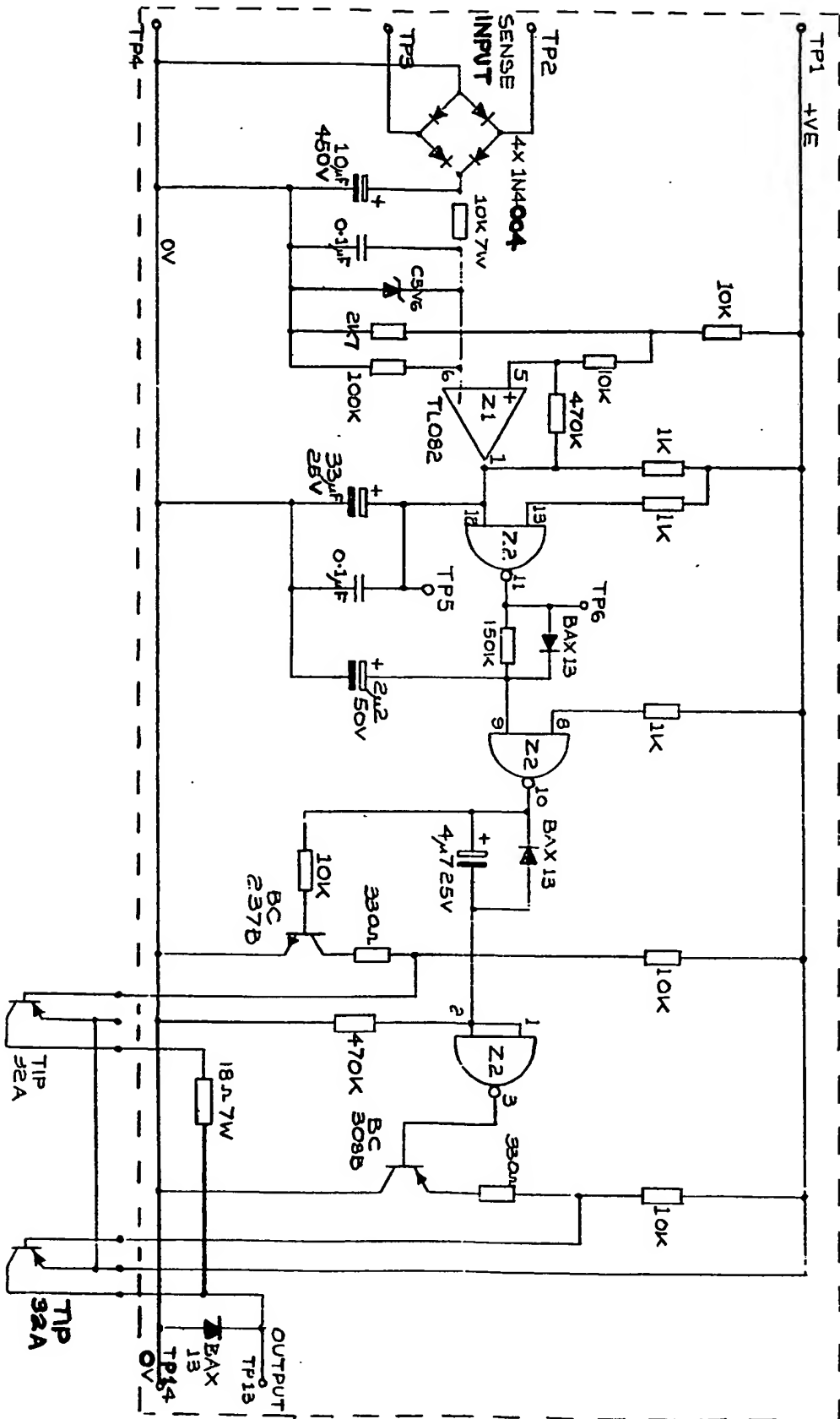
FIG. 7.





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FIG. 8.



## SPECIFICATION

### Improvements in or relating to welding

- 5 This invention relates to welding, which term as used herein, includes brazing.

- The conventional welding shields normally consist of either a handle by which the shield may be held in one hand while welding apparatus is used with the other. In this case the welding shield must be manually placed in front of the eyes before an arc may be struck with the use of the other hand or, alternatively, a pivoting head shield may be used, where the shield must be "nodded" into position before the arc is struck.

- The principle shortcomings of both of these systems is that they rely on the shield being manually moved in front of the eyes before the arc is struck and therefore most secondary protection is available for the eyes. Use of the visor described herein automatic eye protection becomes available.

- According to the invention a welding visor comprising of a face guard, an eye protecting window mounted on the face guard and means so as to make the eye protecting window movable between active (eye protecting) and passive (non eye protecting) positions.

The first actuating means for moving the window from the active to the passive position and second actuating means for restoring the window to the active position.

- One of the said activating means may comprise of electrical or electro-mechanical means and preferably comprising of solenoid actuated means. The other said actuated means may comprise of spring means. The window may be pivotally mounted. The pivotal mounting may be at or adjacent to the upper portion of the window hinged along its vertical sides. The visor preferably comprises of means enabling it to be mounted on the user's head.

- The invention also resides in electric welding apparatus comprising of the welding visor, an electrode holder or torch, and a window actuating control means carried by the holder or sensed from an existing gas supply valve.

- The window actuating control means may comprise of manually operable switch means.

- The electric welding apparatus may include an electric welder, means for electrically connecting the welder to the electrode, and a control unit for controlling the supply of electrical power to the welder in response to said control means.

- The control unit may comprise a first delay circuit operative on operation of the control means, to close the window after a first predetermined time, and a second delay circuit operative, on operation of the control means, to energise the electrode after a second predetermined time which is longer than the first predetermined time.

An embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings, wherein:-

- 70 *Figure 1* is a side view of a welding visor

*Figure 2* is a perspective view of the visor

*Figure 3* is a perspective view of welding apparatus as used for stick welding complete with control unit

- 75 *Figure 4* is a perspective view of welding apparatus as used for MIG or TIG welding complete with control unit

- Figure 5* is a schematic representation of a manual arc welder system complete with visor control circuits.

*Figure 6* illustrates the control circuit for Fig. 5 in more detail

- Figure 7* is a schematic representation of a MIG or TIG welding system, with visor control circuits

*Figure 8* shows in more detail the control circuit for gas shrouded or MIG/TIG systems as in Fig. 7.

- Referring to Figs. 1 to 8 of the drawings, electric welding apparatus comprising of a control unit 10 supplied with electricity through a mains lead 11. In the case of stick welding unit (see Fig. 3) the control unit 10 may contain a switch unit with means to electrically disconnect the welding unit 17 from the electrical supply lead 11. The control unit 10 includes a control lead output socket 18 connected to connector 18a connected to the control cable 19 connected to the welding electrode holder 20 (having attached) thereto by an adjustable clamp 9, a manually operable actuator button 21a and a welding electrode 22.

- Electric power for welding is supplied to the electrode 22 from the welder 17 through cable 23 and connection 24. A workpiece is connected to the earth line 26 and to the welder 17 through connector 27.

- In the case of the manual arc control unit, the visor is operated at a response to the control button.

- In the case of the MIG/TIG inert gas shrouded system, the electrode holder or torch 20 and the control button 21a operate directly on the controls of the welding unit. This in turn operating the gas solenoid valve 61. In this case the sense cable 19 detects the operation of the control button 21a, which in turn operates the visor 30.

- The welding visor 30 is provided for the operator and includes fire resistant face guard 31, the sides of which are connected to a strap 32 for going over the back of the operators head, and a strap 33 for going over the top of the operators head. The visor 30 includes a conventional (tinted) eye protecting window or screen 34 of rectangular form in the front of the guard 31, pivotally mounted about the top of its vertical edges in a frame 35, for movement between an active or

closed (eye protection) position as shown by the etched lines 34a and a passive or open (non eye protecting) position as shown by solid lines 34. A spatter glass 63 or protection glass is provided to protect the filter 34 from damage and also to provide protection during operations such as chipping or grinding. The spatter glass 63 is clear.

A solenoid 36 is provided, mounted in the visor 30, for opening the window 34 and a return spring 37, mounted in the visor, returns the window to the closed position when the solenoid 36 is de-energised. Lead 38 supplies electric power from the electrode holder or torch 20 to the solenoid 36 via a socket 39.

Cable ties 40 are used where appropriate.

The control unit 10 includes a slow attack fast release delay circuit 42 which may be connected to a solid state relay 60, or mains contactor used in manual arc systems through line 42.

A fast attack slow release delay circuit 41 is connected to the solenoid 36 through lines 43, 19, 38.

In use, when energised, the visor window 34 is open. The window 34 is closed by operating button 21a so as to energise line 51, and the slow attack fast release delay circuit 42 is energised to energise relay 60 and supply power to the welder 17 and thus to the electrode 22.

The fast attack slow release delay circuit 41 is also energised to close the window 34 before the relay 60 is energised.

The system is intended to be an accessory to, or an integral part of an electric welding system.

The system simplifies the task of welding. When used with electric welders or electric brazing equipment, many advantages are apparent. Only one hand is used for the purpose of welding, leaving the other hand free. This other hand can be used for positioning the item that is to be welded.

When using this system, it is not necessary to clamp the items that are to be welded together, nor is it necessary to have the aid of an assistant to position the items to be welded.

Since no clamping is required, little setting-up time is necessary. Thus welding operations can be executed in a much shorter period.

The operator can position the electrode 22 to the work with good positional accuracy.

Another significant feature is that of safety, for it is not possible for the operator to look directly at the electric arc whereby eye damage can be sustained. Further with the filter open, the spatter glass 63 is always between the operator's eyes and the work therefore grinding or chipping may be undertaken without danger to the eyes, and without having to change into separate goggles or headshield.

The system is failsafe in that should a fault

occur then the filter glass 34 will automatically close in front of the operator's eyes.

The system is intended to be used for all types of electric welding and brazing equipment.

## CLAIMS

1. A welding visor comprising a face guard, an eye protecting window mounted on the face guard so as to be movable between active (eye protecting) and passive (non eye protecting) positions, first actuating means for moving the window from the active to the passive position and second actuating means for restoring the window to the active position.

2. A welding visor as claimed in Claim 1 wherein one of said actuating means comprises electrical or electro-mechanical means.

3. A welding visor as claimed in Claim 2 wherein said one of said activating means comprises solenoid actuating means.

4. A welding visor as claimed in Claims 2 and 3 wherein the other of said actuating means comprises spring means.

5. A welding visor as claimed in any one of Claims 1 to 4 wherein the window is pivotally mounted.

6. The window is pivotally mounted.

7. The pivotal mounting is at or adjacent to the upper portion of the window.

8. The visor comprises means enabling it to be mounted on a user's head.

9. Electric welding apparatus comprising a welding visor as claimed in any of the Claims 1 to 8, a holder for a welding electrode, and window actuating control means carried by the holder.

10. Electrical Welding apparatus as claimed in Claim 9, wherein the window actuating control means comprises manually operable switch means.

11. Electric welding apparatus as claimed in Claim 9 and 10 including an electric welder, means for electrically connecting the welder to the electrode, and a control unit for controlling the supply of electric power to the welder in response to said control means.

12. Electric welding apparatus as claimed in Claim 11, wherein the control unit comprises a first delay circuit operative, on operation of the control means, to close the window after a first pre-determined time, and a second delay circuit operative, on operation of the control means, to energise the electrode after a second predetermined time which is longer than the first predetermined time.